A NEW SPECIES OF HERRING-LIKE FISH *MICROTHRISSA* (PISCES, CLUPEIDAE, PELLONULINAE) FROM THE ZAIRE BASIN, CENTRAL AFRICA

by

G. GOURENE (1) and G.G. TEUGELS (1)

ABSTRACT. - A new species of freshwater herring-like fish, *Microthrissa whiteheadi*, is described from the Zaire basin in Central Africa. Its relationships with the three already described species are discussed.

RÉSUMÉ. - Une espèce nouvelle de Clupeidae d'eau douce, *Microthrissa whiteheadi*, est décrite du bassin du Zaire en Afrique Centrale. Ses affinités avec les trois espèces déjà décrites dans le genre sont discutées.

Key-words : Clupeidae, *Microthrissa*, Freshwater fish, Africa, Zaire R., New species.

The Clupeidae, an economically important fish family commonly known as herrings and sardines, are for the most part marine. Some genera, however, are restricted to brackish and freshwater, while others occur exclusively in freshwater.

Several genera and species of freshwater Clupeidae have been described from the African continent (see Poll *et al.*, 1984 and Whitehead, 1986a for details). However, despite of numerous recent contributions to their taxonomy, the systematic status and the phylogeny of these taxa are rather poorly known. This is mainly due to the lack of a thorough revision based on both external and internal characters of representative collections.

As part of such a revision, presently undertaken by the authors, this paper deals with the description of a new species assigned to the genus *Microthrissa* Boulenger, 1902. Until recently, this genus included two species, *Microthrissa royauxi* Boulenger, 1902, the type species and *M. minuta* Poll, 1974, both from the Zaire basin, Central Africa. Whitehead (1986b) added a third species, *Microthrissa normanae* from the Pra basin in Ghana, West Africa. Study of the large collection of *Microthrissa* specimens housed in the Musée Royal de l'Afrique Centrale (MRAC), Tervuren, Belgium, which includes all three nominal species, revealed the presence of a new species in the Zaire basin.

MATERIAL AND METHODS

Measurements and meristic counts are the standard ones, as used by Teugels and Thys van den Audenaerde (1979) and Whitehead (1986a). Additional measurements on the body are : caudal peduncle depth (from the base of the last anal finray) ; minimum body depth (from the base of the first anal finray) ; maximum body depth (from the base of the pelvic fins). Several newly introduced measurements are taken on the

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(1) Muséum National d'Histoire Naturelle, Laboratoire d'Ichtyologie générale et appliquée, 43, rue Cuvier, 75231 Paris Cedex 05, FRANCE.

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MICROTHRISSA WHITEHEADI SP. N.
(Fig. 2)

Synonym : *Microthrissa royauxi* Boulenger, 1902 *(partim)*

Holotype : MRAC 23240 Nyonga, Zaire (8°39'S-26°18'E) ; coll. de Witte ; V-1925 ; 42,3 mm standard length (SL).

Paratypes (37 specimens) : MRAC 23241-243 Nyonga, Zaire (8°39'S-26°18'E) ; coll. de Witte ; V- 1925 ; 3 specimens 40,5 - 47,0 mm SL. MRAC 27821, Nyonga, Zaire ; coll. de Witte ; V- 1925 ; 1 specimen 41,4 mm SL. MRAC 29282 - 285 Nyonga, Zaire ; coll. de Witte ; V-1925 ; 2 specimens 39,6 - 42,5 mm SL. MRAC 29344- 347 Nyonga, Zaire ; coll. de Witte ; V-1925 ; 4 specimens 42,5 - 44,9 mm SL. MRAC 29348-349 Nyonga, Zaire ; coll. de Witte ; V-1925 ; 2 specimens 37,7 - 43,0 mm SL. MRAC 29356 - 362 Nyonga, Zaire ; coll. de Witte ; V - 1925 ; 7 specimens 39,2 - 56,5 mm SL. MRAC 29373 - 375 Nyonga, Zaire ; coll. de Witte ; V-1925 ; 3 specimens 42,6 - 54,4 mm SL. MRAC 29319-320 Kabalo, Zaire (6°03'S - 26°55'E) ; coll. Schouteden ; III - 1926 ; 2 specimens 43,2 - 54,4 mm SL. MRAC 29424 - 431 Kabalo, Zaire ; coll. Schouteden ; III - 1926 ; 7 specimens 40,0 - 57,4 mm SL (including 2 cleared and stained specimens). MRAC 102387 Bateba, rivière Uélé, Zaire ; coll. Charlier ; VII - 1955 ; 1 specimen 40,2 mm SL. MRAC 120319 - 321 Bambili, rivière Uélé, Zaire (3°39'N-26°04'E) ; coll. Hulot ; 1948 ; 3 specimens 33,4 - 40,6 mm SL. MRAC 79-1-P-28-29 Mabwe, rive est du Lac Upemba, Zaire (8°39'S-26°30'E) ; coll. de Witte ; IX - 1947 ; 2 specimens 42,6 - 46,8 mm SL.

Additional specimen examined : MRAC 1233 Banzyville, rivière Ubangi, Zaire (4°18'S-21°10'E) ; coll. Royaux ; 1901 ; 1 specimen 54,5 mm SL ; syntype of *Microthrissa royauxi*.

Diagnosis : *Microthrissa whiteheadi* is characterized by the shape of its premaxillary bones, moderately flattened and lacking a medial notch (Fig. 3). Furthermore, the species can be recognized by its numerous (32-40) backward directed premaxillary teeth.

Description : Based on the holotype and the 37 paratypes. Results of measurements are given in Table I.

Head relatively small, about 1/4 of standard length. Eye about 1/3 of head

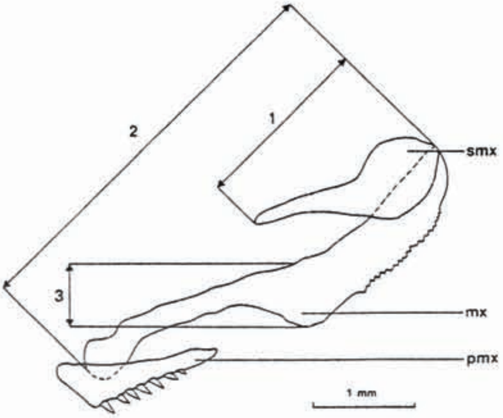

Fig. 1 : Measurements taken on the maxillary complex of Pellonulinae specimens. mx : maxilla ; pmx : premaxilla ; smx : supramaxilla ; 1 : supramaxilla length ; 2 : maxilla length ; 3 : maxilla depth.

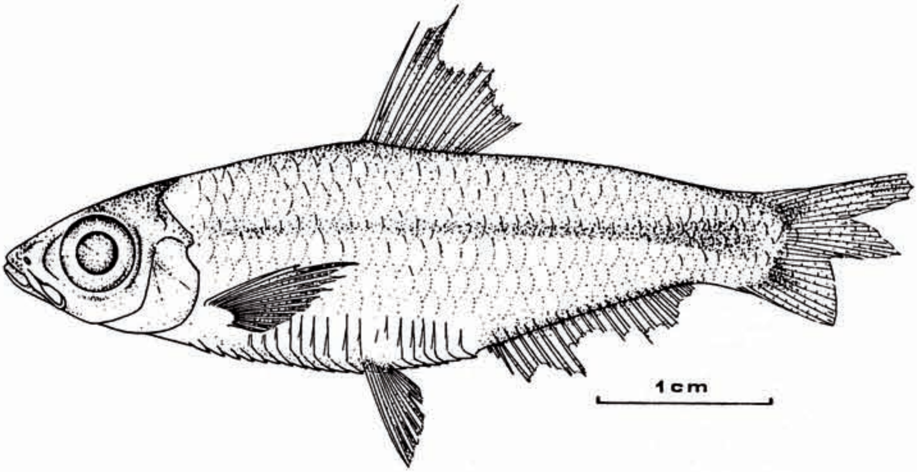

Fig. 2 : Lateral view of the holotype of *Microthrissa whiteheadi*, 42,3 mm standard length.

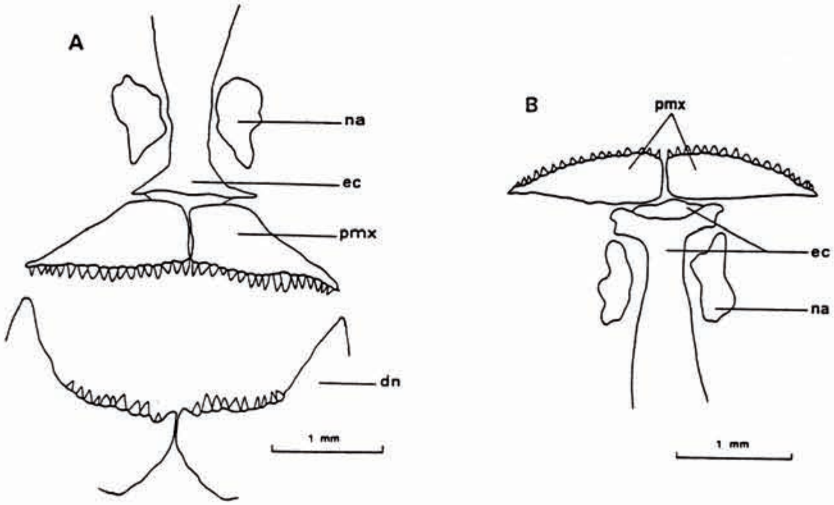

Fig. 3 : Shape of the premaxillary bones in a paratype of *Microthrissa whiteheadi*. (MRAC 29424-231 ; 41,6 mm standard length). A. Front view. B. Dorsal view. A medial notch is absent. dn : dentary ; ec : ethmoid complex ; na : nasal ; pmx : premaxilla.

length, longer than snout length. Snout rounded. Premaxillary bones moderately flattened, lacking a medial notch ; 32-40 small conical backward pointed premaxillary teeth. One group of 3-8 larger conical teeth on each side of vomer. No teeth on the tongue. Maxilla reaching back to anterior eye margin ; its length 5,5-7,8 times as long as deep, with the lower edge bordered with minute conical teeth (13-29). Supramaxilla (2nd or posterior) length 1.8-2,1 times in maxillary length, about as long as maxilla blade ; anterior supramaxilla shaft about as long as its blade. Dentary with sharp backward pointed conical teeth at its symphysis. 5 to 6 (generally 5) branchiostegal rays.

22-29 long and slender gillrakers on the complete first branchial arch (14-18 on the lower part), generally as long as or longer than the corresponding gill filaments.

Table I : Measurements taken on the holotype and the paratypes of *Microthrissa whiteheadi*.

MEASUREMENTS	HOLOTYPE	PARATYPES					
		N	Min.	Max.	Mean	SD	C.L.
Standard length (mm)	42.3	38	33.4	57.4	44.1	-	-
	IN PERCENT OF STANDARD LENGTH						
Maximum body depth	29.5	33	28.9	36.8	31.6	2.0	0.7
Minimum body depth	24.6	34	22.1	31.3	24.8	2.0	0.7
Caudal peduncle depth	11.6	32	10.1	13.2	11.4	0.8	0.3
Dorsal fin length	16.1	28	13.3	16.5	15.1	0.8	0.2
Anal fin length	26.0	27	24.9	29.8	27.1	1.1	0.4
Pectoral fin length	15.4	22	13.6	17.0	15.4	0.9	0.4
Pelvic fin length	20.3	25	17.4	23.6	20.5	1.2	0.5
Predorsal length	50.6	33	49.5	55.7	51.2	1.2	0.4
Prepectoral length	26.9	32	23.6	29.5	26.9	1.2	0.3
Prepelvic length	49.2	27	49.5	53.1	51.1	0.8	0.3
Preanal length	69.5	26	66.3	71.7	70.0	1.3	0.5
Pectoral-pelvic distance	22.2	27	22.0	27.4	23.6	1.2	0.4
Pelvic-anal distance	23.2	25	19.5	23.1	21.7	0.9	0.3
Head length	27.6	35	25.6	29.2	27.9	0.7	0.2
	IN PERCENT OF HEAD LENGTH						
Snout length	25.6	32	20.0	29.0	24.8	2.1	0.7
Interorbital distance	23.1	33	19.1	28.2	24.4	1.6	0.6
Vertical eye diameter	31.6	32	29.0	39.1	-	-	-
Maxillary length	29.9	25	29.8	33.9	31.5	1.3	0.5
Maxillary depth	5.1	25	4.0	5.6	4.9	0.4	0.8
Supramaxillary length	16.2	25	15.2	18.1	16.7	0.8	0.3

Body compressed, moderately deep (maximum body depth about 1/3 of standard length). Belly keeled ; 1-2 prepelvic scutes in front of first pectoral finray ; the first 3 to 4 prepelvic scutes lacking ascending lateral arms (Fig. 4) ; 13-16 (generally 13) prepelvic scutes with a distinct keel ; 5-9 (generally 6) postpelvic scutes with a spiny keel.

Dorsal fin origin closer to tip of snout than to caudal fin origin ; 11-14 (generally 12-13) dorsal finrays ; last dorsal finray at about the same level as last postpelvic scute. Pelvic fin inserted at about the same distance from the tip of the snout as dorsal fin, 8 pelvic finrays ; pelvic fins nearly reaching anal fin ; 20-25 (generally 23) anal finrays. Pectoral fin reaching base of pelvic fins ; 12-14 (generally 13) pectoral finrays.

35-39 (generally 36) transparant, oval-shaped scales in longitudinal series ; a few continuous vertical striae and several incomplete striae on each scale.

Generally 9 (range 9-10) predorsal bones. Total vertebrae 39-40 (generally 39) ; 18-19 (generally 18) abdominal and 20-21 (generally 21) caudal vertebrae.

Colour : In alcohol, preserved specimens brownish-yellow, with a silvery longitudinal band along the flanks, showing a high concentration of melanophores on the caudal part. Base of each caudal lobe blackish. No data available on living colouration.

Distribution : *Microthrissa whiteheadi* is known from the Middle and the Upper Zaire river system (Fig. 5) : (see list of type material for detailed locality data).

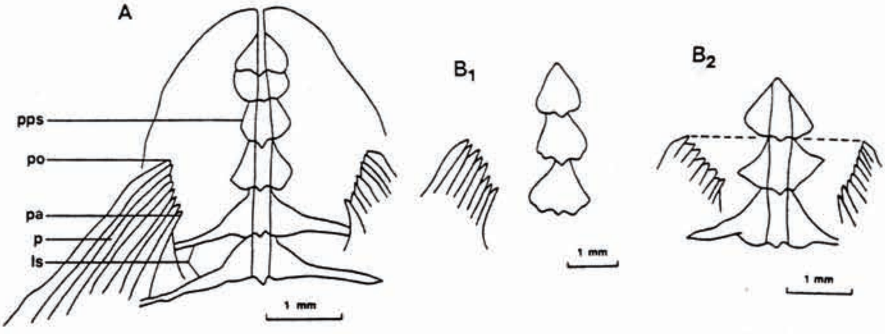

Fig. 4 : Position of the first prepelvic scutes in relation to the pectoral fin origin in *Microthrissa royauxi* (A) and *M. whiteheadi* (B1 + B2). p : pectoral fin ; po : base of first pectoral ray ; pa : base of last pectoral ray ; pps : prepelvic scute ; ls : ascending lateral arms of prepelvic scutes.

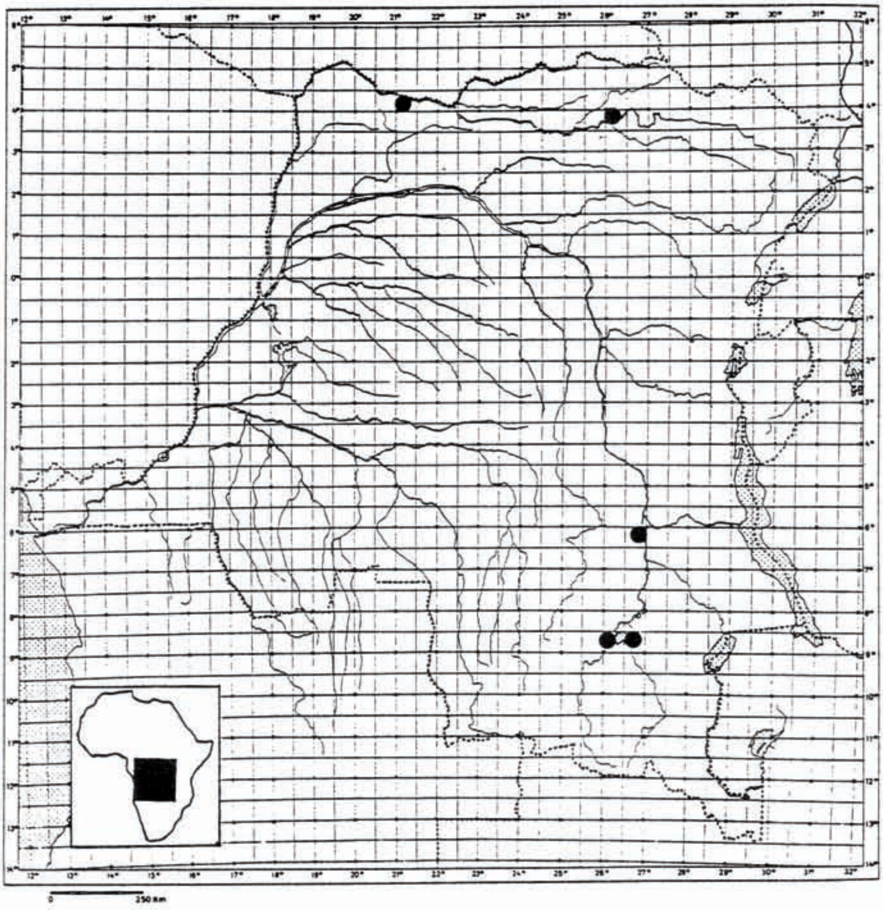

Fig. 5 : Geographic distribution of *Microthrissa whiteheadi*.

Etymology : Named in honor of Dr. P.J.P. Whitehead of the British Museum (Natural History), London, whose numerous publications on clupeoid fishes have contributed substantially to our knowledge of this group.

Relationships : *Microthrissa whiteheadi* is closely related to *M. royauxi*. Moreover, one of the syntypes of the latter (MRAC 1233) was found to be the new species. The most important character to distinguish these species is the shape of the premaxillary bones ; the medial notch as found in *M. royauxi* (Fig. 6) is absent in *M. whiteheadi* (Fig. 3). The latter also has 32-40 premaxilla teeth *versus* 16-26 in *M. royauxi*. These differences are not related to size, as illustrated by the growth series in Figure 6, nor to sexual dimorphism, since specimens of both sexes were examined in both species. The greater number of prepelvic scutes anterior to the pectoral fin origin (Fig.4) is another important feature to distinguish *M. royauxi* from *M. whiteheadi*.

The same characters (premaxilla shape, number of premaxilla teeth and prepelvic scutes anterior to pectoral fin) also distinguish *Microthrissa whiteheadi* from *M. minuta*. Additional characters to separate these species are the number of gillrakers on the lower part of the first branchial arch (14-18 in *M. whiteheadi*

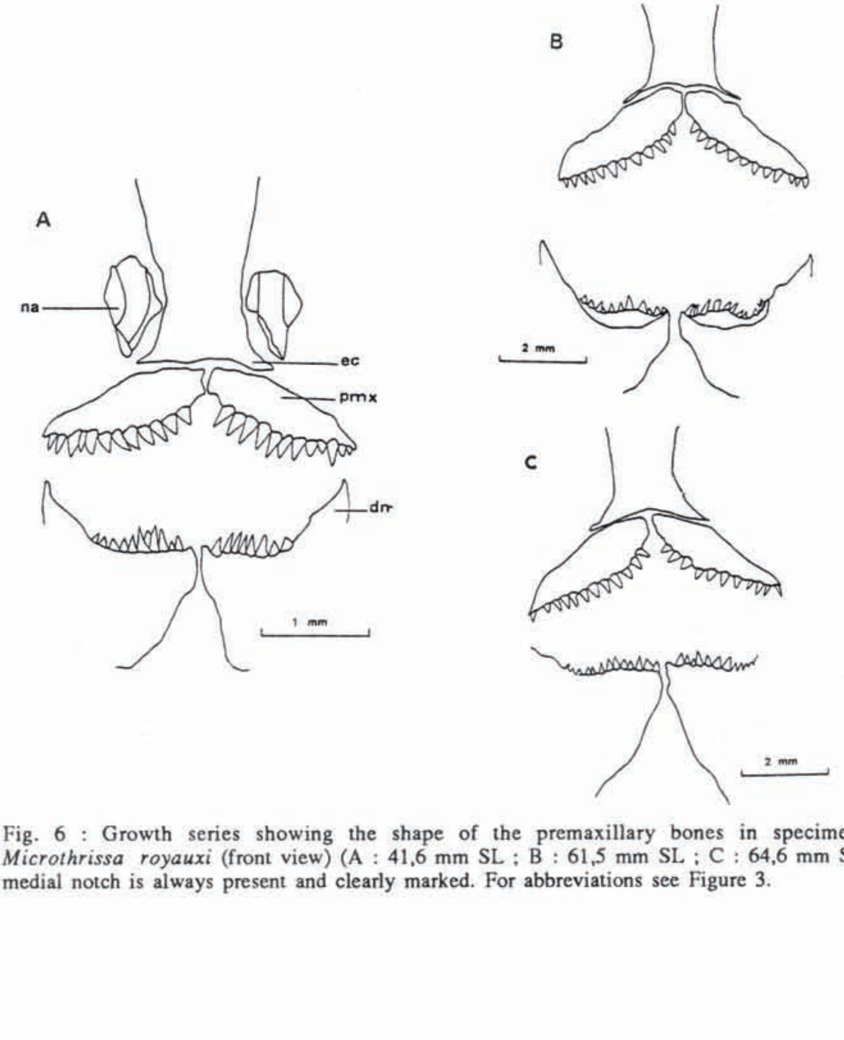

Fig. 6 : Growth series showing the shape of the premaxillary bones in specimens of *Microthrissa royauxi* (front view) (A : 41,6 mm SL ; B : 61,5 mm SL ; C : 64,6 mm SL). A medial notch is always present and clearly marked. For abbreviations see Figure 3.

versus 18-22 in *M. minuta),* the number of anal finrays (20-25 *versus* 19-21) and the number of prepelvic scutes (13-16 *versus* 11-12).

The new species differs substantially from the allopatric *Microthrissa normanae* : in addition to the diagnostic features given above, *M. whiteheadi* has prepelvic scutes in front of the pectoral fins, and fewer gillrakers on the lower part of the first arch (14-18 *versus* 22-23). Whitehead (1986b) stated that *Microthrissa normanae* is quite distinct from its Zaire congeners and the description of *M. whiteheadi* confirms this. The position of *M. normanae* within the genus *Microthrissa* seems doubtful to us and is presently being re-examined.

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